

AMENDMENT AND RESPONSE UNDER 37 CFR § 1.111

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Serial Number: 09/816,603

Attorney Docket: 1327.009US1

Filing Date: March 23, 2001

Title: CONTINUOUS PROCESSING OF THIN-FILM BATTERIES AND LIKE DEVICES

REMARKS

Applicant has carefully reviewed and considered the Non-Final Office Action mailed April 29, 2005, and the references cited therewith. The specification is amended to more clearly define related patent applications. Dependent claim 13 is amended to refer back to claim 11 instead of cancelled claim 12. Claim 16 and claim 22 are amended to solely improve grammar. Claim 21 is amended to recite crystalline layer formation. Claim 42 is amended to recite ion-assist means for aiding crystalline formation. No new matter is added. Claims 11, 13-33, and 36-45 are pending, and consideration of these claims is requested. Please charge any required fees to deposit account 502931.

The Examiner indicated in the Office Action Summary that the informal drawings filed March 23, 2001, were accepted. A replacement set of formal drawings was submitted on March 4, 2004, and appears in PAIR. Applicant respectfully requests an indication of acceptance of the formal drawings in the next office action.

Continued Examination Under 37 CFR 1.114

The Examiner stated that a request for continued examination under 37 CFR 1.114, including fee set forth in 37 CFR 1.17(e), was filed in this application "after final rejection". Applicant respectfully requests that the Examiner correct the record to indicate the RCE was filed after a Notice of Allowance and the payment of Issue Fee and Publication Fee, which were filed solely to allow submission of a Supplemental IDS for consideration by the Examiner. This correction of the record does not affect the remainder of the Office Action.

Claim Rejections – USC § 103

2. The Examiner states that this application currently names joint inventors. The Examiner advised the Applicant of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the Examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f), or (g) prior art under 35 U.S.C. 103(a). The Applicant respectfully notes that

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points out that there was and is only one inventor for this application.

3. Claims 11, 13-15, 18-24, 31, 33, 39-40, and 42-43 were rejected by the Examiner under 35 U.S.C. 103(a) as being unpatentable over OVSHINSKY et al. (US 5,411,592) in view of MUFFOLETTO et al. (US 6,599,580). Applicant respectfully traverses.

With respect to claims 11, 21, 22, 31, and OVSHINSKY:

The Examiner states, "*It is noted that sputtering and laser ablation are ion-assist deposition techniques.*" without providing or citing a reference. Applicant traverses and respectfully requests under MPEP 2144.03 that the Examiner, if he maintains this assertion, provide a reference in support of the unsupported assertion. Sputtering and laser ablation are not ion-assist techniques. Laser ablation is a process that uses a laser to ablate a source material (according to *The American Heritage Dictionary of the English Language, 3rd Edition*, Houghton Press, 1992: "to remove by erosion, melting, evaporation, or vaporization"); thus the laser photons (not ions) is causing material removal (not deposition). Sputtering is also process that causes removal of material (according to *The American Heritage Dictionary of the English Language, 3rd Edition*, Houghton Press, 1992: "to cause the atoms of a solid to be removed from a surface by bombardment with atoms in a discharge tube"); thus even when sputtering is done with ions, the ions are causing removal (not deposition). The removed material can then be carried across the deposition chamber and deposited. Further, the Examiner admits near the bottom of Page 5 of the Office Action that, "Ovshinsky et al do not expressly disclose the specific ion-assist energy technique." Thus, the Examiner has failed to provide a prima facie case for anticipation of the claim as a whole, and the Applicant respectfully requests that the rejection of claims 11, 21, 22, 31, and their dependent claims, be withdrawn.

Further, with respect to claim 11, even if ion energy were used for sputtering material off of a target, where the removed material is later deposited, OVSHINSKY neither describes nor anticipates "a first deposition station that deposits a second layer onto the first layer, wherein the first deposition station supplies an amount of ion-assist energy to the second layer to aid in crystalline layer formation while controlling a stoichiometry of the crystalline layer without

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substantially heating the substrate". Accordingly, reconsideration and withdrawal of the rejection of claim 11, and its dependent claims 13-20, 32-33, and 44-45 is respectfully requested.

With respect to claim 21, even if ion energy were used for sputtering material off of a target, where the removed material is later deposited, OVSHINSKY neither describes nor anticipates "means for depositing a second layer onto the first layer, wherein the means supplies energy to the second layer to aid in layer formation without substantially heating the substrate, wherein the first and second layers are part of a battery". Claim 21 is a means-plus-function claim to be interpreted under 35 USC 112 paragraph 6. The Examiner has failed to show structure in the combined prior art that is equivalent to that of the present application. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

With respect to claims 22 and 31, even if ion energy were used for sputtering material off of a target, where the removed material is later deposited, OVSHINSKY neither describes nor anticipates "a first deposition station and a second deposition station, wherein the first and the second deposition stations each supply energy to the layer to aid in crystalline layer formation while controlling a stoichiometry of the respective crystalline layers without substantially heating the substrate". Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

As to claim 12 and OVSHINSKY:

Applicant believes the Examiner meant claim 13 since claim 12 was previously cancelled. The Examiner cites OVSHINSKY, column 11, lines 39-43, which state, "One final interesting and useful product variation which should be noted is the deposition of these thin-film batteries onto stainless steel substrates on the opposite side of thin-film amorphous silicon solar cells to integrate the collection and storage of solar energy." (Emphasis added) This product variation does not describe nor suggest independent claim 11 feature of "a deposition station that deposits a photovoltaic cell on the battery" nor the dependent claim 13 features of "a station that attaches an integrated circuit to the substrate; and a wiring station that forms conductive paths between the integrated circuit, the battery and the photovoltaic cell." Accordingly, for this reason and for the reasons described above for allowance of the base claim 11, reconsideration and withdrawal

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of the rejection is respectfully requested.

On the matter of claims 14, 15, 18, 19, 23, 39 and OVSHINSKY:

Regarding these dependent claims, for the reasons described above for allowance of the respective base claims, reconsideration and withdrawal of the rejection is respectfully requested.

As to claims 11, 20, 21, 22, 43 and MUFFOLETTO:

MUFFOLETTO describes a “method to improving the electrical conductivity of a substrate of metal, metal alloy, or metal oxide” by “directing a high energy beam onto the substrate to cause an intermixing of the deposited material with the native oxide of the substrate metal or metal alloy.” (See ABSTRACT)

With respect to independent claim 11 and its dependent claims (13-20, 32, 33, 44, and 45), MUFFOLETTO neither describes nor anticipates a “deposition station supplies an amount of ion-assist energy to the second layer to aid in crystalline layer formation while controlling a stoichiometry of the crystalline layer without substantially heating the substrate.” Rather than aiding crystalline layer formation, the described MUFFOLETTO method for improving electrical conductivity causes intermixing of the deposited metal layer 14 with the native oxide layer 12 of the substrate metal or metal alloy 10 (column 3, lines 30-36). MUFFOLETTO neither describes nor suggests using additional or assist energy to aid in crystalline layer formation in the second layer. Further, the combination with Ovshinsky does not produce the present claimed invention. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

With respect to independent claim 21 and its dependent claims (39- 42), MUFFOLETTO neither describes nor anticipates a “means for depositing a second layer onto the first layer, wherein the means supplies energy to the second layer to aid in crystalline layer formation without substantially heating the substrate.” Instead of aiding crystalline layer formation, the described MUFFOLETTO method causes intermixing of the deposited metal material with the native oxide of the metal of the substrate. MUFFOLETTO neither describes nor anticipates using energy assist to aid in crystalline layer formation in the second layer. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

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With respect to independent claim 22 and dependent its claims (23-31 and 36-38), MUFFOLETTO neither describes nor anticipates a “plurality of deposition stations that deposit layers onto the substrate including a first deposition station and a second deposition station, wherein the first and the second deposition stations each supply energy to the respective layer to aid in crystalline layer formation while controlling a stoichiometry of the respective crystalline layers without substantially heating the substrate.” The cited references do not provide this claimed combination. Additionally, instead of aiding crystalline layer formation, the described MUFFOLETTO method causes intermixing of the deposited material with the substrate. MUFFOLETTO neither describes nor anticipates using ion assist energy to aid in crystalline layer formation in the second layer. Thus, claim 22, and its dependent claims (23-31 and 36-38) distinguish over the cited combination of references. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

With respect to independent claims 11, 21, and 43, neither OVSHINSKY nor MUFFOLETTO provide deposition of a photovoltaic cell on the battery. OVSHINSKY at column 11, lines 39-43, describes having a stainless steel substrate (not a low-temperature substrate) with amorphous silicon solar cells on one side and depositing these thin-film batteries onto the stainless steel substrates on the OPPOSITE side of the solar cells (column 11, lines 39-43). In contrast, the present invention describes and claims “a deposition station that deposits a photovoltaic cell on the battery.” Thus, independent claims 11, 21, and 43, and their dependent claims (13-20, 32-33, 39-42, and 45) distinguish over the cited combination of references. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

Further, with regard to claims 21 and 43 and their dependent claims, these are means-plus-function claims, and must be examined under 35 U.S.C. 112 paragraph 6 with regard to the structure shown and described in the present invention as compared to that of the references. OVSHINSKY does not appear to provide any structure for accomplishing their ion assist. The ion assist of Muffoletto intermixes deposited metal with the native oxide that naturally forms on the underlying substrate metal. This Muffoletto structure does not provide the recited function of claim 21 “wherein the means supplies energy to the second layer to aid in crystalline layer formation without substantially heating the substrate” nor the claim 43 “means for depositing a

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second layer onto the first layer without substantially heating the substrate, wherein the first and second layers are part of a battery". Accordingly, reconsideration and withdrawal of the rejection with regard to these claims is respectfully requested.

4. Claims 11, 13-33, and 36-45 were rejected by the Examiner under 35 U.S.C. 103(a) as being unpatentable over SHUL et al. (US 6,432,577) in view of MUFFOLETTO et al. (US 6,599,580). Applicant respectfully traverses. These references do not describe the "deposition station that deposits a photovoltaic cell on the battery." Thus, claims 11, 13-33, and 36-45 and their respective dependent claims distinguish over the cited combination of references. Further, as described above, MUFFOLETTO does not provide energy to assist in the crystallization formation. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

5. Claims 11, 20-22, and 43 were rejected by the Examiner under 35 U.S.C. 103(a) as being unpatentable over Japanese document JP 62-044960 in view of MUFFOLETTO et al. (US 6,599,580). Applicant respectfully traverses. Neither of these references describe the "deposition station that deposits a photovoltaic cell on the battery." Thus, these claims distinguish over the cited combination of references. Further, as described above, MUFFOLETTO does not provide energy to assist in the crystallization formation. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

6. Claim 32 was rejected by the Examiner under 35 U.S.C. 103(a) as being unpatentable over: a) OVSHINSKY et al. (US 5,411,592) in view of MUFFOLETTO et al. (US 6,599,580); and/or (b) SHUL et al. (US 6,432,577) in view of MUFFOLETTO et al. (US 6,599,580); and/or (c) Japanese document JP 62-044960 in view of MUFFOLETTO et al. (US 6,599,580) as applied to claim 11 above, and further in view of MATSUI et al. (US 5,558,953). Applicant respectfully traverses. Claim 32 depends on claim 11, and appears in condition for the reasons provided above for claim 11. Further, Matsui does not describe a photovoltaic cell on the battery, with the claimed combination of claim 32. Additionally, as described above,

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MUFFOLETTO does not provide energy to assist in the crystallization formation. Accordingly, reconsideration and withdrawal of the rejection is respectfully requested.

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CONCLUSION

Applicant respectfully submits that the claims are in condition for allowance and notification to that effect is earnestly requested. The Examiner is invited to telephone Applicant's attorney (952-278-3501) to facilitate prosecution of this application.

If not otherwise provided herewith, please consider this a request for an extension of time for a sufficient number of months to enter these papers. If necessary, please charge any additional fees or credit overpayment to Deposit Account No. 502931.

Respectfully submitted,

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Date

12 August 2005

By

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CERTIFICATE UNDER 37 C.F.R. 1.8: I hereby certify that this correspondence is being facsimile transmitted to the U.S. Patent and Trademark Office, Fax No. 1-571-273-8300 on this 12th day of August, 2005.

Charles A. Lemaire
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